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# USSR Report

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# USSR REPORT

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## INTERNATIONAL ECONOMIC RELATIONS

### 'PRAVDA' PRAISES SOVIET-MONGOLIAN COOPERATION WITHIN CEMA

Moscow Domestic Service in Russian 0350 GMT 11 Jul 79 LD

[Article by Aleksey Krivel in PRAVDA's Commentator's Column: "Deepening Integration"]

[Text] Routine sessions of CEMA standing committees on nonferrous metallurgy and standardization of agriculture have been held in Ulaanbaatar, Berlin and Sofia. The results of their work, just as the sessions of CEMA Executive Committee and the CEMA committee on cooperation in the field of planned activity, which were held a little earlier, are an example of the businesslike and operative approach to the implementation of the decision of the 33d CEMA session on the development of an international socialist labor department with socialist economic integration.

At the session of the committee on nonferrous metallurgy, measures were confirmed on cooperation in the field of improving methods of processing copper ore, and other matters were reviewed, including the possibility of creating in the Mongolian People's Republic capacities for production of wolfram and molybdenum. It was not by chance that Ulaanbaatar was the venue for this meeting. Mongolia is rich in minerals. The Mongolian People's Republic takes part in the implementation of long-term purposeful programs of cooperation approved by the last two CEMA sessions, including a program in the field of power, fuel and raw materials. An international geological expedition made up of CEMA member-countries works here.

Life gives rise to new forms of effective and mutually advantageous cooperation. One of these is through joint enterprises. In the Mongolian People's Republic, the first phase of the Mongolian-Soviet Mining and Concentration Copper-Molybdenum Combine--Erdenet--has been commissioned and is producing concentrates. Recently, a decision was adopted to accelerate the commissioning of the next phases. From year to year, the Mongolian-Soviet Economic Association for the Extraction of Nonferrous Metals--Mongolosovtvetmet--is increasing in capacity. It produces over 90 percent of ores and minerals extracted in the country. An agreement has been signed on the creation of a joint enterprise--Mongolobulgar metal.

The work of the committee and other organs of the council are aimed at the further accelerated implementation of long-term purposeful programs of cooperation and at assisting the comprehensive progress of the economy of the CEMA member-countries.

MANPOWER: LABOR, EDUCATION, DEMOGRAPHY

#### ZLOBIN METHOD IN CONSTRUCTION REVIEWED

Moscow TRUD in Russian 26 Apr 79 p 2

Editorial article: "A Brigade Contract for Every Construction Job"

Text The letter of the Gor'kiy brigade leader Honored Builder of the RSFSR Ivan Aleksandrovich Lobanov, entitled "A Brigade Contract for Every Construction Job," was published in our newspaper nearly 2 weeks ago. It was inspired by the materials and decisions of the November (1978) Plenum of the Party Central Committee and the speech of General Secretary of the Party Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev at the pre-election meeting of voters of the Baumanskiy Electoral District of Moscow.

Comrade L. I. Brezhnev pointed out to the voters that nothing is more important now than conservation and the most rational use of all our potentials and resources. Leonid Il'yich said, "This also requires some reorganization of planning, management methods, the system of indices, and the material incentive. No matter how difficult this reorganization is, we cannot dispense with it."

As applied to capital construction, one of the major sectors of the national economy, this principle means first of all a general distribution of the brigade contract as the best means of enhancing the effectiveness of construction work, as I. A. Lobanov said.

The nature of this new management method is well known. A brigade is assigned the whole series of operations to build an entire capacity ("from zero to delivery of the keys" as they say) such as an apartment house, for example, or the consolidated stage of the operations. The brigade is given a job order to perform all the operations, and a final accounting is made after they are completed.

The brigade contract is a new form of cost accounting that implements the party policy of consolidating economic methods of production management. By furthering worker participation in production management, the brigade cost accounting method combines the interests of the state, the collective, and the individual workers.



When I. A. Lobanov's letter was published the editors of TRUD suggested that the readers discuss problems of introducing N. Zlobin's method in the All-Union Workers Correspondence Conference and recommend ways of expediting dissemination of the brigade contract. The discussion coincided with the 50th anniversary of the First Five-Year Plan, and this was no accident because we owe all the progress and achievements in our work today to the efforts and accomplishments of those heroic years. Brigade cost accounting itself grew out of the famous Stakhanov movement, essentially as a continuation of the remarkable initiatives taken in the course of fulfilling the five-year plans. The brigade contract is closely related to the development of socialist competition. The very fact that these problems are widely discussed is proof of the creative activity of those who are competing in the effort to perfect its forms and methods.

About 70,000 brigades, or more than one-third of the workers collectives, are now working on contract in the USSR. In general they are obtaining good results, exceeding their tasks for growth of labor productivity and reduction of construction costs. These brigades are doing better work and saving more materials.

But the rates of distribution of the brigade contract are below the requirements of the five-year plan. The volume of operations should increase by 6.9 percent a year, but the contract was developed at this rate in 1976 alone and since then the rates have declined considerably.

A good many construction sections are not using brigade cost accounting at all. And the managers of some organizations are paying lip service to introduction of the contract, neglecting technical-engineering preparations, long-term planning of operations, and material supply of the construction sites.

Brigade Leader I. A. Lobanov's letter mentioned these and other difficulties that are interfering with the distribution of the contract and impairing its effectiveness.

For a month and a half TRUD's readers participated in the workers correspondence conference with "A Brigade Contract for Every Construction Job" on its agenda. Dozens of people, both construction organizers and users of brigade cost accounting right at the sites, appeared on the pages of our paper. Workers meetings were held at 2,848 capacities under construction, where defects in organization of labor and use of the contract were frankly discussed in the presence of nearly 295,000 people. Over 15,000 persons spoke at these meetings, and letters with "Workers Conference" marked on the envelopes were sent to the editors of TRUD.

It is characteristic that not one letter or speech expressed the slightest doubt as to the value of the brigade contract. All those who reported their experience in working on the contract pointed out that this way of organizing labor changes every worker from a mere performer of a task to a production manager and offers people the broadest creative possibilities.

Honored Railroad Worker G. Yezhikov-Babakhanov's letter from L'vov discussed the first stages of the contract in SU /Construction Administration/ No 1 of Dorstroytrest, mentioning that "The brigade cost accounting raises the builders'



standards for each other and makes for very strict control within the brigade, since the qualified and honest workers will never permit any negligence to interfere with the general appraisal of their work or the construction deadlines."

As the secretary of the Sverdlovskaya Obkom Yu. Petrov pointed out, "Brigade cost accounting not only permits delivery of capacities ahead of schedule and in good condition but also serves the equally important purpose of teaching people to think creatively, broadly and economically and enhancing their sense of responsibility for the general cause."

But most of the contributors to the conference emphasized not so much the advantages of the contract, which are obvious, as the problems of its wide-scale distribution. They named defective construction planning as one of the chief obstacles to brigade cost accounting.

Foreman V. Grin' of SMU /Construction-Installation Administration/ No 6 of Krasnodar Trust No 11 said in his letter, "Now the trust management wants us to construct the dormitory facilities of the Polytechnic Institute by N. Zlobin's method. It costs 450,000 rubles and according to the norms it will take 12 months to build. But the customer has allocated only one-fourth of the necessary resources. How can this capacity be built on contract? We will be compromising an important project."

At a workers meeting in Dnepropetrovsk the chief engineer of SU No 2, N. Kirnichanskiy, also complained about customers who try by fair means or foul to include capacities on the title lists that are not provided with financing, plan documentation, or equipment. He said, "I think the rule must be strictly observed of removing a capacity from the title list if the customer does not have the resources to complete its construction in the regulation time."

Of course he is right, but how can this rule be made to operate automatically? This question was answered by USSR Minister of Construction G. Karavayev in his speech published in the newspaper under the headline "A Real Plan is Needed." He considers it expedient for the customers to compensate the builders for losses due to alterations in the plans, late or incomplete documentation, or miscalculations in financing. He also thinks it is time to start continuous 2 year planning.

The contributors to the conference think that implementation of these and some other suggestions would help not only to disseminate the contract but also to curtail the volumes of unfinished construction and to concentrate forces and resources on construction starts.

Almost all the speakers at the meeting and the authors of the unpublished letters agree with Brigade Leader I. A. Lobanov that inadequate engineering preparation and technical-material supply of the sites are serious obstacles to the contract, and the facts bear out the urgency of the problem. About 40 percent of the capacities now under construction are without operational plans, and over one-third on the brigades' failures to carry out contractual agreements are due to late and incomplete delivery of materials and structures.

The letter of A. Gorelkin, leader of a brigade of bricklayers in Yakutsk, drew the following by no means unique picture: "At one capacity a crane has been standing for 2 months now and no work has been done. At another, the piles have been driven and the girders and panels have been brought in, but there is no crane and they have been lying there for 4 months now. At a third capacity the planking has been done and much of the equipment has been installed, but everything is covered with snow and no more work can be done."

The contributors to the conference suggested many solutions to this predicament. M. Yemeliyanov, brigade leader of SU No 1 of the Sakhalinpromstroy Trust, writes us that "Close contact is needed between the plants making the structures, the administrations for technical and operational procurement, and the builders. In other words, the brigade contract must be introduced in all the related organizations and the accounts must be reckoned with all of them according to the final result."

The speakers pointed out the necessity of abandoning the present practice of estimating the requirement for materials and structures per million rubles' worth of construction-installation operations. Both the norms and the calculating method are obsolete. The quantity of cement, metal and wood for each capacity must be calculated on the basis of the particular volumes of operations and accurately determined according to the plans.

And a great many letters pointed out that a brigade contract does not require materials or structures indiscriminately and in droves but in a full assortment in accordance with the schedules of operations, and the technical-operational procurement service is indispensable in this case. Unfortunately this method of material supply of the sites is spreading very slowly. It is now in use in only half the trusts and administrations, while the rest are doing it the old way, being satisfied with small supply divisions.

Note here that the most difficult problems of planning, engineering preparation, and material supply are easier to solve when wide-scale introduction of N. Zlobin's method is accompanied by modernization of the construction management system. Its search for new methods of operational management and organization enabled the Vinnitspromstroy Combine to convert all brigades to the contract and to fulfill the plan in all indices.

Ukrainian SSR Minister of Industrial Construction V. Areshkovich discussed the combine's experience at a meeting. Adoption of the two-unit management system, regulation of the ITR's [technical-engineering workers] functions, consolidation of the combine's divisions and brigades, and other measures enabled it to remedy many defects in its operational organization.

But the trouble is that the Vinnitsa Combine has now had 2 years' experience, but the new construction management system is still in the experimental stage and has very few adherents at the combine.

Study and introduction of Vinnitspromstroy's experience in other collectives must be organized. This should be done first of all by the trade union organizations

of the trusts and ministries and the trade union obkoms. Jointly with the ministries and departments, the Trade Union Central Committee has planned a practical-scientific conference on problems of the brigade contract. It will be a turning point in the wide-scale introduction of this construction method.

A great deal was said in the conference about relations with collaborators. Ye. Konstantinov, leader of a brigade of fitters of the Tulgorstroy Administration, A. Litvin, leader of a brigade of carpenters and cement workers in Dnepropetrovsk, and A. Kovalev, chairman of the Rostov Obkom of the Trade Union of Workers in Construction and Industrial Construction Materials as well as many others agreed with I. Lobanov's opinion that it is worse if one brigade at a capacity is working by N. Zlobin's method while the others are working by the old one. A. Kovalev wrote, "The 'open' contract must be more widely introduced to include all components of the construction assembly line and of the services cooperating with it."

Note that it is still better if the partners in construction are permanent ones. That is when lasting friendship and competition are formed and the "Workers Race" yields its rich fruits. The trade union committees should move forward as organizers of the continuous or open contract, as it is also called, and of competition among collaborating collectives.

G. Yugay, a deputy division chief of the Trade Union Central Committee, was one of the first to raise questions about the material incentive. As already indicated, the brigades are receiving bonuses now for completing tasks on contract, for reducing operating costs (compared with the estimated ones), for activating capacities, and for conserving parts and structures. In a word, the bonuses are based on so many considerations that the workers often do not know for which one they are receiving an award.

Meanwhile errors in computing wages and awarding bonuses are unfortunately not all that uncommon. They occur because the contract documentation is still too complicated, or because some manager or other is trying to "economize" on the brigade under contract.

The trade union committees should speak their piece here. It is their duty not only to explain to the workers the remuneration system under brigade cost accounting but also to check fulfillment of all contractual obligations both by the brigade and by the management of the construction administration.

Many more questions and problems were raised in the conference, and many suggestions and recommendations were made. For example, some of the speakers consider it irregular for a brigade to work on contract only 2 or 3 months out of year when it is listed as a full-fledged contract collective on the books of the trust and the ministry. Questions were asked about the moral and material responsibility of the parties for breach of a contractual agreement, about the material incentive of the ITR's who introduce N. Zlobin's method, about the contradiction between brigade cost accounting, the final aim of which is the completed capacity, and the overall indices of the trust's activity, et al. To be sure all these problems will be discussed in the future in our newspaper.

In conclusion I want to thank all of you comrades who have contributed to the workers correspondence conference for your keen interest in the developmental problems of the sector, for your energetic spirit, for your constructive approach, and for your effort to work for the national interest. For it is upon these qualities of the Soviet man that the brigade contract depends.

Over 60 people participated in the first USSR Workers Correspondence Conference conducted on the pages of our newspaper. We hope USSR Gosstroy, USSR Goskomtrud, the construction ministries, the planning and supply organs, and other organizations concerned will study the suggestions made in the conference and plan specific measures to implement them and to create conditions for wide-scale introduction of brigade cost accounting. This will help to solve one of the most important problems in our economy, that of enhancing the effectiveness of capital construction.

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## TRANSPORTATION

### RIVER FLEET PREPARES TO TRANSPORT HARVEST

Moscow VODNYY TRANSPORT in Russian 29 Jun 79 p 2

[Text] The question under discussion in the presidium of the union's central committee was the work of the union committee and administration of the "Krasnyy Flot" SSRZ ["Red Fleet" ship building and repair yard] toward organizing a competition for timely and high quality preparation of the fleet to transport the new harvest. It was noted that this enterprise's collective has a fine tradition in delivering equipment, spare parts, fuel and fertilizer to the villages and in bringing back agricultural products. Last year, for example, the ships registered to this yard transported 370,000 tons of grain cargoes. Taking the lead in high quality transport of grain with maximum vessel loading was the crew of the motorship "Neva," which carried 40,800 tons of grain, exceeding projected limits by almost a thousand tons. For its selfless labor in transporting last year's harvest the crew was awarded a diploma from the VTsSPS [All-Union Central Council of Trade Unions]. Inspired by this high appraisal, the crew reviewed its capabilities and gave its word to transport 45,000 tons of agricultural products this year.

In the fourth year of the 10th Five-Year Plan, the Factory committee and administration of the "Krasnyy Flot" SSRZ opened up the socialist competition for timely and high quality preparation for the present grain shipping season. Almost 70 percent of the enterprise's workers are striving for a communist attitude to labor, while 679 people have already become communist labor shock workers; 16 brigades and 11 ship crews wear the honorary rank of "Collective of Communist Labor."

To prepare the fleet to transport grain cargoes in the 1979 navigation period the administration and Factory committee worked out a special list of measures. A staff and public commission were formed which included representatives of the Factory committee and Factory management as well as union activists. They took the schedule for returning vessels to technical readiness under their unremitting control. They sent the best brigades to repair these ships. A labor rivalry was organized during the time between navigation periods under the slogan "excellent quality vessel maintenance to support grain shipment." As a result, the repair totals did not show a single complaint and the fleet was put into operational readiness 2 days ahead of the established date with evaluations of "good" and "excellent."



Recruiting crews for the ships, the factory committee and administration tried to keep those crews already experienced in grain shipment. Before their first voyage all ships held meetings at which union activists were elected and tasks to insure accident-free operation of the fleet and safe-keeping of the grain cargoes were laid out. Following the example of the motorship "Neva" collective, the crews of the "Kergana," "Zelenograd," "Donets," and many other ships accepted increased obligations for the shipment of grains.

A schedule has been set up at the yard for dispatching management personnel and engineering technical workers on the line where they will render direct on-site assistance to the crews. Provisions have been made to send a force of mechanics out on the line to make a preliminary inspection of those ships intended for grain shipment and to clear up the volume of preventative work. Two passenger launchers have been outfitted with welding rigs and the necessary materials for repairing ships during loading operations in the Rostov port. To insure uninterrupted maintenance of ships bound for grain loading, specialized composite brigades have been organized into a two-shift operation at the navigational and current maintenance facility. All this will undoubtedly contribute to the fulfillment of the mission of the 1979 navigation season.

The presidium of the trade union central committee made note of the positive work done by the administration and factory committee to prepare and shipment of cargoes from the new harvest and charged the republic, reservoir and factory committees, along with managers of those enterprises involved in the shipment of vegetables and grain, to adopt the necessary measures to further develop the competition aimed at insuring timely and high quality shipment of agricultural products.

## TRANSPORTATION

### RAIL CARS USED TO TRANSPORT HARVEST

Moscow GUDOK in Russian 1 Jul 79 p 1

[Editorial: "The Rail Car Workers of the Grain Routes Are Called Upon to Prepare the Rolling Stock Quickly and with High Quality for Rural Freight"]

[Text] The tempos of the grain harvest are increasing with each day. The new harvest has flowed into the granaries in the south of the country and they are preparing to meet it in the east and in the center. The shops are being filled with fresh vegetables and fruits. All this means that the harvest season is upon the railroad workers. We must provide a green light to all agricultural goods without exception. And everything begins with the rail car and with preparation of it for shipments.

Shipments of the harvest for the rail car workers means to equip the closed empties and refrigerator rolling stock for travel. This is careful preparation of tank cars for fuel, without which the tractors and combines cannot go out onto the fields and without which trucks are unable to move to the grain elevators. This is timely support of the customer with functioning cars for operative transport of agricultural equipment.

The rail car workers have just as many concerns now. And they understand their responsibility for the fate of the 1979 harvest. The collective of the rail car preparation terminal of Balashov-1 Station of the Privolzhsk Railroad has taken on increased socialist pledges on the threshold of the harvest season: to provide high-quality preparation of rail cars for shipments of agricultural goods, to turn them over only upon first presentation, to produce no fewer than 90 percent of closed rolling stock for grain and to reduce the idle times of the group of 27 rail cars on the preparation front by 1 hour.



The pledges of the Balashev workers, as we can see, are very high, but there is every basis to assume that they will be fulfilled with honor. Because these pledges are founded on a firm base. Extensive work was being done even during the winter, they repaired the tracks and bridges, created a reserve of parts and materials, reviewed the technology and concerned themselves with raising the qualifications of people. Preparation for the harvest season was taken under the leading control of the party and trade-union organizations, and this also gave a moral right to the Balashev workers to appeal to all rail car workers of the grain loading railroad and to all railroad workers connected with preparation of the grain for shipment of the new harvest with the call: to enter a competition with excellent quality of washing and repair of boxcars and for total satisfaction of the people.

The call of the Balashev workers found a warm response among the rail car workers of the entire system. All the elements from which the production process is made up are being checked again and again at production, in the unloading stock preparation points, maintenance stations and at the depot shops and vigorous measures are being applied to the so-called "bottle-necks."

However, things are not going smoothly everywhere. A few days ago GUDOK reported about the serious omissions permitted at a number of points of the USSR Caucasian Railroad. And this railroad has already begun the harvest season. The managers of this mainline should adopt decisive and urgent measures to improve the situation.

This year was difficult for the farmers. The railroad workers were called upon to apply even greater efforts not to aggravate these difficulties and to universally help to preserve the collected harvest for the people. Go out to the forefront of the struggle for timely support and delivery of agricultural goods, comrade peoples' controllers, komсомол "searchlight operators," party and trade-union activists! Look with a keen eye not only at your own work but at those of related services. Look to see whether you can really pass over the facts when expensive rail hopper cars designed for grain with self-sealing doors are being utilized to deliver goods that contaminate the cars, even when wheat, chemicals and poultry! Declare a decisive struggle with squandering of grain panels.

The fact that empty cars are sent back with tons and with tens of tons of unloaded grain and undrained petroleum products continue to come into use at the stock preparation points and to the washing stations is a very serious concern as in previous years! Let all the rail car workers had to clean

rolling stock of 670,000 tons of freight residues and since the beginning of this year this figure already comprises approximately 300,000 tons. And after all, this is not only ruinous human labor, but also disorganized operation of the terminals since a qualified work force is distracted and the time for washing and repair of rail cars, a time which is now so dear, is lengthened!

As soon as the talk got down to time, one must attentively study how the terminal capacities are being utilized. We still have much unproductive idle time of people and equipment. Since the beginning of the year, the idle times have already comprised approximately 200,000 hours for 180 terminals. They are happening again because of shortage of materials and spare parts, but the main reason is untimely delivery of empty cars. And here the rail car workers sit with their hands folded: an alarm should be sounded at the slightest delay!

To prepare the rail car for shipments means not only to clean and wash it. It must be repaired so that there is not a single slit and generally no possibility at all of a loss of freight en route. Sometimes grain rushes from passing cars in a thin stream. But this small stream calculates to tons of ruined grain products. Significant losses of fuel designed for agricultural machinery operators may be permitted because of a trivial malfunction of the drain device of a tank car.

The refrigerated rolling stock also requires great concern. The brigades of many depots turned to bringing order to the equipment of sections as early as spring by their own efforts so as not to delay it during the harvest season. And now, when the volume of shipments of perishable goods is increasing, the equipment terminals should be taken under special control. One must not permit the products transported in "cold" cars to spoil due to untimely supply of fuel, water and lubricants to the sections.

The slogan for all railroad workers related to transporting agricultural goods should now become the call of the rail car workers of the Balashov terminal: "Our grain is for us to save and we should transport it to the granaries of the motherland rapidly and without losses!"

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CSO: 1823

## TRANSPORTATION

### IMPROVING THE CONDITION OF RAIL CARS SO THAT MORE GRAIN HARVEST IS TRANSPORTED

Moscow GUDOK in Russian 15 Jun 79 p 2

[Article by A. Kabanov: "A Shield Against Losses -- How to End the Shortage Which May Peril Threatening in the Heat of the Harvest Season"]

[Text] The most acute problem faced by the railroad workers on the eve of the grain harvest this year is that of the grain panels. After all, this problem of preserving the grain shipments is the essence of the matter. Moreover, the grain mainlines are now experiencing an acute shortage of panels -- no reserves have been created and those that have been are out of order for the most part.

Last year serious hopes were placed on packing timbers, but practice showed that the problem cannot be solved by their use alone. The main grain-hauling railroads must be provided with panels in total volume and a reserve should be created in time. Otherwise, serious complications are inevitable during the heat of the grain shipments.

What is the basis for the almost constant shortage of grain panels? This is primarily in poor organization of production at enterprises of the Main Administration on Repair of Rolling Stock and Spare Parts Production and the Main Administration of Capital Construction. It is sufficient to say that the plants had a shortfall of 62,000 grain panels alone this year, including the plants of TsURS [Main Administration of Capital Construction] -- 32,200, and plants of TsTVR [Main Administration for the Repair of Rolling Stock and Production of Spare Parts] -- 29,700. Because of this, there is now essentially no operative reserve on those most important grain railroads as the Privolzhsk, North Caucasus, Southern Urals, Tselinnaya, West Siberian and Odessa-Kishinev, although not much time remains until the beginning of the mass grain shipments. The

managers of these main administrations explain the insufficient volumes of panel production primarily by a shortage of lumber. This is a serious reason and we shall talk separately about it. However, much of the guilt also lies on the plant workers themselves. They frequently regard panel production as secondary, assuming that serious attention to this problem should be devoted at the end of spring or the beginning of summer and that the remaining time is, alas, the most important product. When May arrives and telegrams reporting about the threatening situation with grain panels fly from all directions into the ministry, an all hands' job begins at the plants. However, the lost time usually cannot be made up.

All this does not remove responsibility from those workers of the Main Administration of Material-Technical Support, who also "had a hand" in creating the shortage. During the past few years they have frequently referred to the fact that there are no funds for wood and that they can't solve the problem of panels without lumber. But sufficient funds have now been allocated and there is still a shortage of wood at the plants: measures were not implemented in time to provide these enterprises with lumber. Moreover, not only GUMTO [Main Administration of Material-Technical Support] is guilty of the developed situation. The work and traffic services and the freight management have created a shortage of the devices most needed for grain shipments "by common efforts." After all, the railroad workers themselves are guilty of the fact that the lumber is poorly transported from the procurement points. And frequently, those very grades which are required to manufacture panels are exported last -- the transport workers, strange as it may seem, do not hurry to call the lumber for their "own" enterprises.

However, deficiencies in organization of panel manufacture are far from the only cause of the current difficulties. We bear no fewer losses due to the irresponsible attitude toward utilizing the available panels. There is essentially no record kept of the presence of panels, the regulating tasks on turning them over are not being fulfilled and no storage has been organized at those same Privolzhsk and North Caucasus, Sverdlovsk, Southern, L'vov, Transcaucasus, Donetsk and Moscow railroads. It must be confessed that small barns, huts and various domestic structures frequently appear not far from the station which, if one looks closely, are nothing more than used panels by designation. And those which remain lying in anticipation of the mass grain shipments at the station are already completely unsuitable by July-August: here and there they are spoiled by snow and rain and in some places if you look the boards are simply broken. And the real guilty parties of a bandit attitude -- you can't find a better word -- toward the grain panels very rarely bear the proper responsibility.

More than 11 percent of the total number of panels in the network are now in an unsuitable state. And repair of them is essentially not being carried out and if it is being carried out, then piecewise, in one's own sweet time. Matters are especially poor on such railroads as the Belorussian, Far Eastern, Odessa-Kishinev and (again!) the Privolzhsk. And it must be noted that very many demands, requests and alarm signals come from the Privolzhsk Railroad in the heat of the grain shipments -- there are not enough panels!

There is still some time until the beginning of mass grain shipments of the new harvest and maximum efforts must be concentrated so that the duties of the plants will be filled up, the entire available stock of panels will be put in order and they will be repaired and stored. To assist the plant collectives in this matter, responsible workers of the main administrations are leaving for many enterprises. Ten-day accounting has been introduced for the main grain-shipping railroads to keep track of panel deliveries. It should be hoped that the situation will be corrected by the middle of July. However, these operative measures are still not a radical solution of the problem. Obviously, the time has come to think about fundamental changes in the procedure of keeping records of panels. Possibly, it is at least worth partially applying an accounting procedure toward these devices which exists with regard to rolling stock. Otherwise, panels thus remain "ownerless!"

Something has now been done in this direction. Specifically, to eliminate the practice of "intercepting" panels travelling according to regulating tasks, usual until recently, it has now been decided to ship them by complete freight documents. Now there is hardly anyone who will decide to seize panels travelling to where they are needed along the railroad. This is an intelligent measure and one hopes an effective measure. In turn this is just as serious a struggle with redeployment of panels and with a careless attitude toward them and with the idea that "a panel is a minor thing." The attitude toward grain panels during the mass grain shipments should be no less responsible than that toward closed cars.

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## TRANSPORTATION

### PROBLEMS OF DIRECTION AND ORGANIZATION IN RAIL TRANSPORT

Moscow GUDOK in Russian 15 Jun 79 p 2

[Article by S. Kasatyy: "Running Idle"]

[Text] We continue our discussion of timely problems of management and organization, begun on 20 February by the article "A Prisoner of Inertia." In the present situation when transport is experiencing serious difficulties, improvement of management and organization is one of the most important problems faced by railroad workers. Discipline in execution, clearness of planning and operational regulation, consideration of as complete and extensive information as possible when making management decisions and creation of a healthy moral-psychological situation in labor collectives -- this is an incomplete list of the most important trends of the search in this matter. It is very difficult to evaluate the economic effectiveness of these management measures. Just as it is difficult to determine quantitatively what careless, poorly thought-out management of one or another transport subdivision is. The reader can judge about this from the material presented below.

"Ach, this is the Saratov division!" One can hear the sighs of the managers of the services and departments of the Privolzhsk service. "They don't know how to work there. A brigade must be sent."

And brigades are put together. One or two "adjustment" brigades are operating on the side of the administration. In other words, these are "duplicates" which take on the matter instead of division, department, depot and station managers.

And now the management team leaves without having accomplished any significant change. And can it really be changed within several days?

To be sure: it won't do. The curve of loading goods decisive for the division -- cement, petroleum and petroleum products -- rolls continuously downward. Overall unloading diminished by more than 100 rail cars per day. The tasks on freight turnover are not being fulfilled. Compared to the level achieved at the end of the last five-year plan, the turnover of freight cars has slowed down by almost one-half. Labor productivity decreased. The cost of shipments above the planned cost has increased by 15 percent. The average daily mileage of a locomotive comprises only 264.2 kilometers. Even if one assumes that diesel locomotives travel 40 kilometers per hour, this means that they are standing idle for 18 hours per day.

I know many division managers and its enterprises. Most of them are experienced, knowledgeable, conscientious workers. They are confident that they are giving all their efforts and capabilities to raising operating activity. But if you look, the division is in constant turmoil.

The division duty officer V. M. Yemtsov has been working for tens of years in railroad transport. Among many others, he was asked the following question: "Are you satisfied with the current style of work of the division? If not, then why not?"

Vasiliy Mikhaylovich, as duty officer for the division, is naturally worried: The division was "overstocked" with a working fleet of rail cars.

"There are now eight trains ready for dispatch at Anisovka, while the Yershov workers are not taking them away," he says. "Generally we have up to 10 block trains every day whose route lies through Ozinka and Astrakhan' to Kazakhstan and to the Northern Caucasus that are not received. We have our own problems. Our terminal is not a through terminal. Four tracks instead of the 15 necessary remained at Saratov-2 Station after reconstruction for reception and dispatch. The freight flow through the terminal is increasing from year to year."

Vasiliy Mikhaylovich said painfully that the row of dispatchers in their division has been diminished and that frequently they are simply not trusted. And anyone who feels like it issues instructions.

"Sometimes you grab your hair. You don't know whose order to carry out," complains the division duty officer. We recently



formed a platform turntable with covered heated shelter. It was supposed to have been sent to the East Siberian Railroad for lumber. They initially ordered us to form this heated shelter at Sennaya. We drove there. A "retreat" followed. We headed for Valakovo. We hadn't quite reached it until new instructions arrived: 'Send it to Balashov!' We turned it over by junction with the Kuybyshev Railroad -- at Gromovo Station. More than two days were spent on this ordeal."

An exceptional case? Alas, no. The division essentially has no clear, thought-out plan of operational work. Let us say closed rolling stock is travelling for a load of cement to Vol'sk. Instructions arrive unexpectedly: "Stop! Return and take it to Atkarsk to the procurement terminal."

Ach, this is a rapid change! The duty officer for the railroad administration V. I. Nikitin transmits the order to the division: "Due to nonacceptance of trains at Urbakh Station, I authorize four cars with destination of Astrakhan' to be sent to Petrov Val as an exception."

The deputy chief of the railroad comrade Sidorkovich seconds this instruction: "Accept two trains with destination of Station imeni Maksim Gor'kiy for Urbakh Station and one train with destination of Tikoretskaya Station with turnover at Atkarsk."

Is your head spinning? Yes, but what is the reason? There is hardly anyone who can think about this. No one knows either the near or remote prospects of the division. There is no clear plan even for today.

Little is being done in the division, for example, to tighten the rears of the locomotive and rail car facilities. Just take the rail cars. Their staff for almost all maintenance terminals is made up according to labor plans. But there are not enough people at Karamysh, Trofimovskiy-2 and Saratov-3 Stations. Instead of the two- or multigroup, the single-group method of inspection and preparation of freight trains for the trip is most frequently employed. One group of rail car workers prepares one tank car within one hour at Knyazevka and Neftyanoy. If there are still block trains during this time, this means that the last of them stands idle for exactly as many hours as cars have accumulated in front of them. It is not surprising that tank block trains sometimes stand idle for days at the terminal while awaiting dispatch.

Many years of observations convince one that the "first face" of the division began everything. The poorly thought-out

actions of the division chief, D. D. Zlykov suddenly lead to confusion. That goes double for his respect for people. His "stern" conversations reduce people to tears.

Of course, a chief should be demanding. But within the bounds of correctness. He has no right to forget about tactfulness toward his subordinates and toward their human worth, needs and requests. Unfortunately, Zlykov attaches no significance to any of this.

And after all, the division chief gives the tone to all managers. The supervisors of the rank and file take an example from him.

The task of the manager is not to "crawl into" fine points and details on every aspect. But if he thought it necessary to study a situation in detail, he should show an example of heuristic thinking, as the scientists say. But it is even emphasized here that this has long become the law for others.

"We locomotive engineers," the department chief of the division Ye. I. Kuznetsov and the deputy chief of Saratov depot N. P. Belov related to me, "are working at present like firemen: where there's a fire, we go. Send so many diesel locomotives to a place and we send as many as necessary. Moreover, as always they must be sent urgently without any preparation. We have no schedule of any kind. One memory remained from the named schedules of brigades, even those servicing passenger trips. The engineers frequently sit idly. And at the same time there are lots of 'overtime' workers."

This is the style of the division management. It is understandable that the operational situation, delay of long-range passenger trains travelling along several railroads frequently depend on their neighbors. But coordination with them and information about the arrivals and departures at the Saratov Division depend largely on the local managers. The "diseases" of the division are internal to a greater degree than external.

Obviously, the railroad administration agrees with this diagnosis. After all, the "adjustment brigades" appear in the division unbidden. And wouldn't it be better to organize affairs at the Saratov Division itself?

To do this, of course, would require extensive and universal analysis of the established situation and of finding the true causes of the delay. Undoubtedly this is a more laborious matter than petty trusteeship. But then it is more effective.

## TRANSPORTATION

### LABOR PROBLEMS ON RAILROADS DISCUSSED

Moscow GUDOK in Russian 20 Feb 79 p 2

[Article by A. Shirokov: "A Prisoner of Inertia"]

[Text] "We are wearing ourselves out," was heard frequently from the managers of different ranks. "We are working from sunrise to midnight with practically no days off."

"We have already resigned ourselves to this, one can say," one of the managers said sadly. "We sit until noon at the selector, working on reports and plans and we begin to work on urgent matters toward evening. But it has recently become fashionable to shout to the right and to the left by the selector and from the platform. If a conversation is face to face, they can also answer here. But when communications is one sided, everything is permitted. They can curse you out, but you sit in the room and silently swallow pills."

Whether visiting one or another division of the railroad, one frequently observes a nervous situation. One person -- the chief -- generally creates it. His nervous mood is transmitted to everyone. And he himself is nervous because someone "higher up" is nervous. One involuntarily thinks, why is this so? Because the person called upon to manage begins to pull out people for cause and without cause? Is something obtained from him? Then who is guilty? Are the executives poorer? but after all you were entrusted with adjusting the work! It turns out that all this proceeds in most cases from lack of confidence of one or another manager in his own actions and on a lack of skill in organizing people.

I recall in this regard a meeting with the chief of the Voronezh Diesel Locomotive Repair Plant Aleksandr Petrovich Kosonogov. I talked with him on approximately the same topic and he very accurately noted:

"The subordinates saw your indecisiveness and confusion and you forget how to write. A manager should make a decision quickly without expecting instructions from above in the most difficult situations. It is better to rearrange things somewhat on the way and to make corrections."

My mission to Karaganda coincided with the arrival here of a brigade from the administration of the Yselinnaya Railroad -- the deputy chief of the freight service I. N. Skardiyeveskiy, the deputy chief of the locomotive depot service S. N. Mustafin, inspector general M. A. Nagorniyak and somewhat later -- the chief engineer of the track service -- I. I. Durnovtsev. What happened? Was there an interruption in the work of the division? Are the local managers not coping? Nothing of the kind. In the words of these representatives of the administration, the division is operating quite stably and its chief Yu. A. Pastrigin is an energetic and thinking manager.

"The situation of the railroad is complex and they decided to direct the service managers on the spot," explained those on a mission.

"But after all, here at Karaganda matters are proceeding more or less normally?" I attempt to express my own judgment.

"This is now our most crucial division. Coal, you understand yourself!"

But what I can't figure out is why such a representative visit to the division was required.

Each of the arrivals of course found something to do. Nobody spent his time without purpose. We waited together in the terminal dormitory and I could observe how they left early and returned late and then again left for the selector to report to the railroad administration about the results of the day. These reports were completed at 12:30 of the first night. In the morning, having hardly awakened, Safar Nurmanovich Mustafin lifted the telephone receiver and called the locomotive depot. He was interested in matters, recorded the necessary data in his notebook of whom to praise and whom to scold, issuing orders. There is nothing blameworthy in this. But after all, I thought, the depot chief and the chief of the locomotive department and also the division chief could call the same comrades from their apartment during these morning hours. And this was naturally the way it happened.

They told me later at the depot:



"We only manage to answer telephone calls. The same questions are asked from the division and from the railroad administration. And inevitably the chief or deputy chief is called to the telephone by them and some kind of information or other is required."

You unwillingly sympathize with the depot managers as well as the managers of other enterprises, incidentally, the same as with the managers of the railroad division. There are selection meetings, a mass of current questions, all types of coordination and confirmation, trips to the rayon and oblast organizations. When one is at the enterprises, when is there time to work with people?

Incidentally, let us return to our people on detached duty. They know their business and solve many problems on the spot daily and without a slowdown. But can they substitute for the local managers? This is inevitable in some situations. Although Skardiyeveskiy, Mustafin and Nagornyak tried not to permit substitutions.

They planned to return to Tselinograd when suddenly there was a telegram: "Your detached duty is being extended." For what? They telephoned the railroad administration. "Sit down," they answer, "the railroad chief has not yet issued instructions to recall you from the detached duty."

And the responsible managers, each of which left a lot of unfinished business at Tselinograd, "sit" and look for work, essentially interfering with matters here. To avoid this, they contact the colleagues of their own services by telephone and they contact other divisions, that is, they are already performing their daily duties, so to speak, on the side.

Is there much benefit from these detached duties?

The brigade had no sooner left than the deputy chief of the railroad G. Kh. Gaynutdinov arrived at Karaganda. It seemed strange that he referred to the conclusions of his comrades who had visited here. The first thing that Gaziz Khabibullovich did was to hold an extensive meeting at 2000 in the evening. The division workers and managers of the terminal enterprises sat from 2000 to 2200 and listened to practically the same thing that they listened to by day from the selector.

Are there not too many meetings? People sit in different meetings daily for half the working day. Moreover, they frequently do not know about what they can specifically ask and what information is required. They go round in circles with their document cases filled with different lists. Is it really

impossible to firmly determine about which, at what time and to whom one must report clearly and briefly?

A nervous situation is inevitably reflected in the overall efficiency and on the health as well. Thus, the station chief T. N. Shiganov resigned at the Karaganda Marshalling Yard -- the physicians determined nervous overexertion. His deputy also became ill. People are under tension, usually referring to the situation.

Yes, the situation in transport is complex and changes rapidly. Yesterday everything went smoothly, but today something is disrupted. And they are already beating you. Thus it was with the chief of the Karaganda Division Yu. A. Kastrigin. They spoke kind words about the division over the selector, but literally the following day Yuri Aleksandrovich was "dressed down" for a single missed indicator. And now he himself feverishly "drives" the division workers on detached duty. And you hear how the division chief talks over the telephone to one of the managers: "In short, you covered up the work." Although it was obvious from a subsequent conversation that this was not at all true and the statement that "you covered up" was torn from the tongue by inertia. Thus, the shout from the railroad administration travelled along a descending path.

The manager could in no way forget that his every step and every word are reflected in the working mood of many people. There is no way one can forget that in a complex, say even an alarming situation, the manager should be self-restrained and collected and should show an example of organization and business-like attitude.

The situation which they had to encounter at Karaganda is typical. Unfortunately, these facts are not the only ones and, in the opinion of many railroad workers, the time has come to talk about them aloud and to reach conclusions.

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## TRANSPORTATION

### IMPORTANT TASKS FOR THE RAILWORKERS

Moscow IZVESTIYA in Russian 27 Jun 79 p 2

[Article by V. Mudrov: "Important Tasks for Railworkers"]

[Text] The USSR Ministry of Railways collegium in expanded meetings has discussed the tasks of railworkers relating to the fulfillment of the CPSU CC (Communist Party, Soviet Union Central Committee) "Regarding Further Improvement of Ideological and Politico-Educational Work". I.G. Pavlovskiy, the Minister of Railways, delivered the report.

The report and speeches critically analyzed the progress of fulfilling national economic plans in rail transportation, and the status of organizational and ideological work in labor collectives. It was noted that the country's railroads are operating under stress. Serious deficiencies are occurring in the organization of train traffic, in routine maintenance and repair of equipment. Production-installation paces are not being maintained in all areas, and lags have been permitted in the erection of a series of projects having social-domestic service roles.

With these conditons, particular attention has been focussed upon the necessity for consolidating organizational and managerial activities in the rail sector, rendering of specific and effective aid by the railroads and enterprises in the fulfillment of plan tasks and socialist obligations. It was emphasized that, as required by the CPSU CC decree, transportation must increase personal responsibility on the part of cadre for the matter entrusted, for the educational consequences of administrative activities. The collegium pointed out that the criteria for evaluating the work of managers at all levels must be efficiency, and final results, and the status of educational work in the collectives.

Particular significance accrues to a well organized supervision and verification of implementation of decisions adopted. In this



connection, the collegium noted a lack of discipline on the part of managers in a number of ministerial sub-placements, rail roads and enterprises. They have charged with undertaking measures in the shortest time frames to insure unconditional fulfillment of decisions made by higher-echelon organs. The situation of lack of control noted in the decision of the collegium, negatively effects not only production matters, but the education of cadre as well.

The necessity was noted for a comprehensive strengthening of labor and production discipline in the lower elements of transportation, and it was recommended that moral and material incentive programs be utilized more flexibly to provide incentive for those who work creatively and with initiative. This work is particularly needed now, during the large scale transportation period for passengers, freight from the new harvest, of raw materials and fuel for the establishment of winter reserves, when even an insignificant violation of the precise rhythm of train traffic may lead to very substantial losses.

At the ministerial collegium meeting the importance was noted for further improvement in work with letters and delegations of our workers. An integrated precise procedure has been established for the review of correspondence, measures have been outlined for improving the supervision of this work, and attention has been focussed upon its educational consequences.

The collegium devoted considerable attention to the development of and improved efficiency of socialist competition and to a broader dissemination of advanced know-how. It was noted that not everywhere does the competition achieve real improvement in production activity, nor does it provide the requisite influence upon the education of the workers.

In rail transportation, a broad system of mass information facilities has been established, which in practice reaches every railway worker. The collegium charged the organs of the transportation press under the direction of party organizations to raise with even greater emphasis upon principles questions relating to accelerated scientific-technological advance, improved efficiency, and quality of work. Instances of unsuitable reactions to criticism expressed in the press media were decisively censured.

Detailed examination was made of questions regarding improved organization of political and economic training, and for consolidating its ties with production. Measures have been developed to strengthen educational work in institutions of higher learning, technical schools, and in railway transportation schools. Major opportunities were outlined for consolidating cultural-mass, and athletic-educational work.

Participating in the work of the Ministry of Railways collegium were the director of the CPSU CC Department of Propaganda, Ye.M. Tyazhel'nikov, and the director, CPSU CC Department of Transportation and Communications, K.S. Simonov.

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## TRANSPORTATION

### ON COMPLETION OF EASTERNMOST SEGMENT OF BAM

Moscow GUDOK in Russian 1 Jul 79 p 1

[Article: "BAM -- The 'Silver' Link Has Been Laid!"]

[Text] The first passenger and freight trains arrived here at Urgal-2 today, 30 June, at an interval of 35 minutes. The passenger train arrived at the station while it was still in the dead of night in Moscow -- at 0245. Those who became the owners of "An honorary ticket on the first passenger train" -- the best machine operators, bridge builders and track repair workers -- according to the results of the competition of builders, travelled on its 19 cars.

A solemn meeting of the builders and residents of the village was held on the event of the arrival of the first trains at the station. The chairman of the ispolkom of the Verkhnebureinskiy regional council of peoples' deputies V. Shushakov, manager of one of the subdivisions which began construction of the eastern section of the BAM [Baykal-Amur Mainline Railroad], K. Kurochkin, chief of bridge-building detachment No. 51 V. Petrov, brigade leader of installers of SSMP [expansion unknown] Ukrstroy I. Kampaneyets and supervisor of the complex brigade of SSMP Moldavstroybam A. Yefimov opened the meeting.

Member of the CPSU Central Committee, first secretary of the Khabarovsk party kraykom A. K. Chernyy, chief of the Far Eastern Railroad A. G. Andreyev and builders of the mainline gave talks at the meeting.

Those gathered at the meeting met with enormous inspiration the greeting of General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev, in which he warmly and heartily congratulated the builders of the eastern section of the BAM.

The participants of the meeting assured the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and Comrade L. I. Brezhnev personally that they would apply all efforts to fulfill the task of the party and government with honor in construction of the Baykal-Amur Mainline Railroad.

The "silver" section was laid solemnly today at the point where the two detachments of builders -- the eastern and western -- met at the Urkal'tu siding and a monument was unveiled in honor of the glorious labor victory.

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## TRANSPORTATION

### AUTOMATION OF RAIL CLASSIFICATION YARDS DISCUSSED

Moscow GUDOK in Russian 7 Jun 79 p 2

[Article by A. Pisarev, Chief of Project Design Technology Bureau for the Automated System of Controlling Railroad Transport, and V. Buyonov, Laboratory Chief, Computer Technology Department for the All-Union Scientific Research Institute of Railroad Transport of the Order of Labor's Red Banner]

[Text] We continue discussion of the problems of automating technological processes which was opened by the statement of L. Loyko, chief engineer of the Minsk Tovarnaya station ("The Advantages of Advance Information" on 29 March). The authors of the material published below are of the opinion that computers supplying operational information to technical services stations should not be concentrated in the computer centers, as was done at the Belorussian station, but in the classification yards themselves.

The first and perhaps the most important state of work in the automation of classification yards has passed. The standard classification yard automated control system, based on small, modern, third-generation computers, has completed testing and been put into fulltime service at the Gor'kiy classification yard and the Darnitsa, Perm', Kinel' and Yaroslavl' main stations. The scientific-procedural development of the system was done by the computer technology department of VNIIZhT [All-Union Scientific Research Institute of Railroad Transport of the Order of Labor's Red Banner]. Project planning, including computer programming support, was carried out by the Project Design Technology Bureau of ASUZhT [Automated Systems of Controlling of Railway Transport]. The computer centers of the Southwestern, Northern, Sverdlovsk, Southeastern, Gor'kiy and Kuybyshev railways also took part.

The principal tasks of the ASU [automated control system] are to automate the control processes, prepare documents on the trains, conduct accounting and analyze the operation of the classification station.

Basic data entered into the computer for operation of the ASU comprise telegram texts of formation sheets and operational reports on movements of trains and cars within the station.

Hardware consists of two EHS-1010 computers situated at a central control point and equipment for operational exchange of information between station workers and the computers. This equipment consists of teletypes, video terminals with television screens (displays), and printers--all plugged directly into the computers. The computers are also tied directly into the railroad information telegraph channels. These channels feed the formation sheet telegram texts into the system. The computer meticulously checks the information. It immediately informs the operator sending the report of any errors detected. After it is checked the report is entered into the data bank.

As each operational event takes place (arrival, breakout of cars, dispatch of trains, etc.), the operators immediately enter the appropriate information into the computer. On the basis of this information an operational dynamic model is worked out in the computer memory showing the location of trains and cars in the classification yard and on approaches to it.

What can this automated system do at classification stations?

Maneuver and station dispatchers, duty station masters and workers in the technical services office can call up from the system varied information necessary for management of the station: data on this or that train or car, expected arrival information, presence of cars in the classification yard by each destination in the assembly plan. The computer presents its responses either on the display screens or on the printers. This process takes from one to two seconds. The maneuver dispatcher's display screen can constantly present current information on the presence of cars on the classification tracks (information on weight, relative length and total number of cars and destination in the assembly plan). After a train arrives and the checks have been verified the formation sheets, which are already in the computer, are "regenerated" and the computer prints out the classification sheet.

Once the rolling stock is set out in the departure yard the teletype operator writes down the car numbers and sends them via telegraph channels directly into the computer. With this information the computer selects information on the cars from its dynamic model, prepares and prints out the train's formation sheet and summarized information in the required number of copies. Additionally, the computer produces a formation sheet on the assembled train for transmission to its destination station.

Train and car information stored in the ASU is periodically used to inform clients of expected arrival of cars for unloading and to prepare initial information for the railroad computer center on the basis of which operational plans for train and maneuver work at the station are developed.

Automation of work processes in the technical services stations is not yet completed. Practical development is now underway on new tasks which will soon be implemented. First of all there will be automated receipt of

accounting forms--calculation and analysis of the time cars stand idle in the station, preparation of reports on total station work by shift and by 24-hour period. A task is also being developed that will optimize the selection of operational decisions on receiving and establishing priorities for train disassembly, including parallel disassembly.

Today it can be firmly stated that the accounting operations carried out in the technical services offices of the stations mentioned have ceased to impede the railcar movement. Complete realization of the ASU objectives will allow a decrease of 1.2 hours in the labor required to process each train. All this establishes preconditions to increase labor productivity and to free many workers in the technical services offices. The handling time for trains in the arrival yard has already been cut by an average of 5 to 6 minutes and in the departure yard by 7 to 8 minutes. The time that cars stand idle at Darnitsa, for example, has been cut by an average of 25 minutes and in Perm' by 12 minutes. These stations have freed 20 and 10 workers, respectively.

As already reported in GUDOK the question of introducing ASU to classification yards was examined by the board of the Ministry of Railways. A decision was adopted to install similar systems in classification yards on all the most important routes.

The introduction of ASU in the next few years to appropriate classification stations on entire routes will have a great additional effect, primarily in the resolution of problems in operational interaction. Already this year eight more route assembly yards will receive automated control systems.

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## TRANSPORTATION

### REPAIR OF RAILROAD CARS AT YARDS DETAILED

Moscow GUDOK in Russian 7 Jun 79 p 2

[Letter to the editor and response by GUDOK correspondent I. Vertel']

[Text] Our depot, Kondrashevskaya-Novaya, is an open-air enterprise—there are no walls and no roof. Therefore, even current maintenance, especially in winter, is very difficult to carry out.

Everyone knows of such conditions, but this does not make it any easier for us. To make matters worse, it has become common practice to send us gondola cars requiring major repairs.

We understand, of course, that when such cars come in for alignment there is no way to avoid them; they must be put back into shape. But when these "heaviest" jobs are sent from other depots, that becomes downright ugly.

The main supplier of such units to us is the mechanized preparation point at the Dolzhanskaya station. Actually this is not just a point but a fine depot: the people work in a warm shop; they have four "Donbass" machines in their equipment inventory; they even have auxiliary production sections. But just imagine, if you can: they do not want to take on cars requiring major repairs so they shove them over to us. In some cases we have 50 or more arriving per block.

We are convinced that "they don't want to," having visited Dolzhanskaya. They have a crafty setup there: the easier jobs are sent into the hangar but the harder jobs remain on track 11. Then when a new block is collected, it is sent, with the approval of management, to us.

It is interesting to note that among the gondola cars standing in the shop we found some with petty, if not to say inconsequential, malfunctions and we could not even determine the reasons that cars 6653307, 6898164 and 6878893 had even been uncoupled. It was as if they had wound up in repair by mistake.

This is no way to run a railroad. Gondola cars should be repaired where they arrive. This first of all, and secondly one should after all consider our difficult conditions.

[Signed] V. Boyko, V. Srochenko, public controllers

Kondrashevskaya-Novaya.

The authors of this letter are absolutely correct when they say that working conditions at Kondrashevskaya-Novaya and Dolzhanskaya are inequitable. But then that is understandable--the enclosed, mechanized car preparation point at Dolzhanskaya has no equal, not just on this line but in the entire network!

Consequently, Dolzhanskaya is obligated to repair more cars better than the others. But then the car service managers do not agree and present these arguments. The Debal'tsevo department is the line's leader in the shipment of coal. It receives more gondola cars than the others and, naturally, more cars with malfunctions. But they must be repaired immediately so they can be put right back into coal service. Therefore Dolzhanskaya strives to insure that the largest possible number of semicars passes through the preparation point with the time they are under repair cut to a minimum.

How well this is being achieved can perhaps be judged by the fact that last year, for example, the norm for time under repair was met, as they say, to a T. But even then the daily average of cars remaining out of service exceeded the norm by 80 units. "Can you just imagine what it would have been if they had run cars requiring major repairs into the hangar?", ask the service managers. "Instead of three being returned to service there would have been, in the best case, only...So it is necessary to send them to other points and depots."

But here a question arises: are the car repairmen at Kondrashevskaya working at something other than shipment of fuel? Or could they renovate especially ill cars quicker than their Dolzhanskaya colleagues?

Having accumulated a sufficient number of "hard cases" Dolzhanskaya humbly asks the management and receives permission to send them right back to Kondrashevskaya. And then the Voroshilovgrad department tries to shunt its out-of-service cars to Debal'tsevo or to the very same Dolzhanskaya. And they also succeed at this; during the past year, for instance, more than 5,000 out-of-service cars were transferred to these neighbors.

"Sick" ones there and "unhealthy" ones back--still there is a shortage of empty cars for loading.

It is unwise to hide a disinclination to tackle cars requiring major repairs behind this legalized shuttling of out-of-service cars from depot to depot.

"It may very well be," agrees the deputy chief of services, Ye. N. Konashonok, "that we have no other choice. Many out-of-service cars come in, and mainly to the Debal'tsevo department; they cannot cope with the repairs there so it becomes necessary to make some 'adjustment.'"

The most suitable way out of this situation is to load up the preparation points on other lines and to repair the semicars where the malfunction is discovered. But this is not the solution if dozens of "sick" cars come in to Kondrashavskaya from Staryy Oskol and the car repairment there limit themselves to writing "junk" on each of them in chalk.

But since Donetskaya cannot eliminate this abnormality, the car service management should still organize their affairs so that this "shuttling" is cut to a minimum and rolling stock is repaired where it comes in, without anyone picking out what is easier.

It seems to us that the possibility of doing this does exist. Take the Dolzhanskaya point. Gondola cars are often brought into the hangar there with malfunctions that could be corrected without even putting the cars on a machine.

This is explained by the fact that it takes a lot of time to single out such a car. But then it is not too difficult to sort out those cars which need major repairs and to leave them on the receiving track. There is ample time for this.

But perhaps the matter lies elsewhere. The line has completely forgotten of such a thing as current uncoupled maintenance. There are even no machinists at the technical service points who could do such maintenance.

It is clearly evident that organizing such maintenance would help to cut down the waiting line for the "Donbasses" and time would be found to recondition those semicars that are uselessly shuttling from one depot to another.

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## TRANSPORTATION

### DEVELOPMENT OF PROGRESSIVE TYPES OF PIPELINE TRANSPORT DISCUSSED

#### Promising Approaches Described

Moscow PLANOVoyE KHOZYAYSTVO in Russian No 11, Nov 75 pp 19-29

[Article by Yu. Bokserman, Deputy Chairman of State Experts Commission, Gosplan USSR: "On New, Progressive Types of Transport"]

[Text] The further development of our economy urgently requires a constant search for new designs and industrial processes capable of fundamentally improving the effectiveness of social production. It is already quite clear that traditional approaches and extensive methods cannot assure the further growth of the country's economic potential, labor productivity and the necessary rate of growth of national income. These statements also apply directly to the fuel and power complex, whose development is associated above all with the geographic distribution of deposits of oil, gas and coal, the main supplies of which occur in the eastern parts of the country and especially in Western and Eastern Siberia, while almost 50 percent of fuel consumption is in the European part of the USSR and the Urals. This has led to the complex problem of transporting large quantities of fuel from east to west. In this context we must stress that in spite of steps that have been taken to relocate energy-consuming enterprises into eastern areas and the accelerated development of nuclear power in the European part of the country, the flow of fuel into the central and western regions of the country will continue to be sizeable for some time.

The solution of this problem for oil and gas by traditional methods requires extremely substantial capital investments and consumption of pipe made from high-quality metal with alloying additives.

Currently the greatest attention is being given to Western Siberia, where in a brief interval the country's main oil and gas base has been constructed. The yield of oil there will reach 700-710 million tons in 1985 and that of natural gas 125-135 billion cubic meters. In essence, all further increases the nation's oil and gas output will come from the West Siberian complex. "At the very beginning of the 'offensive' into Western Siberia," said L. I. Brezhnev at the

16th Komsomol congress, "the following slogan was proposed: Take its riches not by numbers but by skill; that is, using the newest equipment and technology. And a good deal has been done in this regard."

Currently, the most important thing is to organize effective transport of gas from this region. If we set a target of the transmission of an additional 300 cubic meters of gas a year to the European part of the country by modern optimal gas pipelines made from pipe 1,420 mm in diameter and at a working pressure of 70 atmospheres, we shall have to build 10 main gas pipelines with a total length of about 40,000 kilometers. Their construction would require capital investments on the order of 22-25 billion rubles and about 20 million tons of pipe; but in practice it is impossible to allocate this amount to our gas industry.

Accordingly, we must find other methods of transporting large quantities of gas from West Siberia into the European part of the country. Of extreme importance in this connection is the incorporation of new processes for gas transmission involving extensive use of so-called "multilayer pipe," the design for which was developed by scientists at the Institute of Electric Welding, Ukrainian SSR Academy of Sciences, under the leadership of Academician B. Ye. Paton. Using available extremely simple equipment, the institute manufactures from low-alloy water-piped steel of variety 09G2SF from the Novolipetsk Metallurgical Plant experimental piping with a diameter of 1,420 mm having multilayered walls, which not only meets all the requirements for high-pressure gas pipeline pipe to be used in northern pipelines. This work has made it possible to select the optimal design for piping with multilayered walls and to develop the assembly and welding equipment required for its manufacture.

At the end of 1975 it is planned to complete the installation of equipment in an experimental plant for the production of multilayer pipe at the Khartsyzsk Pipe Plant; this pipe will be used to build an experimental gas pipeline in the northern part of Tyumenskaya Oblast which will make it possible to test all technological aspects of the construction of gas pipelines from multilayer pipe for pressures of 100-120 atmospheres.

The extensive incorporation of multilayer pipe requires a fundamentally new technology for contact welding of nonrotating joints on large-diameter pipelines. Together with organizations of Minsftegazstroy (Ministry of Construction of Petroleum and Gas Industry Enterprises), Minelektrotekhprom (Ministry of the Electrical Equipment Industry) and the Ministry of Instrument Making, the Institute of Electric Welding has rapidly developed and assembled a complex of mechanisms and machinery for contact welding of nonrotating joints on main pipelines with diameters up to 1,420 mm, for conditions including those of the Far North. The first model of this complex was manufactured in 1975 by the Experimental Plant of the Institute of Electric Welding and was handed over for production testing in the construction of the Soyuz gas pipeline from Orenburg to the western frontier of the USSR. The tests were successful. On the basis of its operation in the construction of the Soyuz gas pipeline, necessary changes were made in its design, after which the Institute of Electric Welding manufactured a production model of the modernized K-700 machine. In 1976 an



interdepartmental commission recommended the complex for series production. The complex based on this machine is being used successfully in the construction of the Urengoy-Chelyabinsk gas pipeline for laying pipe 1,420 mm in diameter. The plants of Minneftegazstroy have also manufactured the first industrial units.

Operation of the first pipe welding complexes confirmed their significant advantages over existing domestic and foreign units for similar purposes. By this new method, two pipes can be welded in 7-8 minutes, with the welding process completely automated and performed according to specified programs independently of climatic conditions, producing a high-quality weld.

The use of the new process and equipment will make it possible to increase labor productivity by a factor of 4-5. The first models of the machinery attained a productivity of up to 6 welds an hour, so that a brigade of 15 men could do the same amount of work as would have required 60 men with manual welding. As labor organization is further improved, productivity may be increased to the rate of 8 or more welds an hour.

Minneftegazstroy is devoting considerable attention to the development of new complexes for contact welding and to organizing their extensive use in the construction of main pipelines. Foreign companies are showing considerable interest in the new welding technique. The extensive incorporation of the new welding equipment requires extremely rapid organization of the series production in Minneftekhimprom's enterprises and mastery of the series production of mobile electric power plants with capacities up to 1,000 kW.

This April, members of the Institute of Electric Welding (Inst. Ye. O. Paton) and Minneftegazstroy conducted an interesting experiment in the northern sector of the Urengoy-Vyngapur-Surgut-Chelyabinsk gas pipeline. They assembled a section of pipeline made from monolithic pipe from the Khatyrsk plant, into which inserts of multilayer pipe were welded. After the requisite preparation and filling of the pipeline with air, an explosion was set off, as a result of which the monolithic pipe was completely destroyed along a short section, while the multilayer inserts withstood this catastrophic process. The experiment once again confirmed the extremely high reliability of multilayer pipe.

The State Experts Commission has discussed an estimate of the technical and economic indices of a gas pipeline made from 1,420 mm piping extending 3,000 km from the deposits of the northern regions of Tyumen'skaya Oblast into the central and western regions of the country. The following results were obtained:

	Monolithic pipe	Multilayer pipe
Working pressure	75 atm.	100 atm. with moderate expansion of gas to -17° C
Annual capacity, billion m <sup>3</sup> Commercial gas	24	27

The use of multilayer pipe strengthened by a coiled design would give a decrease of 12-14 percent in unit metal consumption, of 14-15 percent in unit capital expenditures, and of 13-14 percent in unit effective cost [privedennyye zatraty]. The calculations for construction of gas pipelines with working pressures of 70, 100 and 120 atmospheres allow for the necessity of extensive use of electric drive in compressor stations instead of gas turbines, which require significant quantities of gas; of piping with internal sealing, which makes it possible to increase the throughput of gas by about 4-5 percent; and of moderate cooling of the gas.

In spite of the considerable effectiveness of multilayer pipe, construction of a plant with a capacity of 1 million tons at the Vyksa Metallurgical Plant is still not proceeding satisfactorily, while the production of high-pressure steel fittings and high-capacity gas pumping units for pressures of 100 and 120 atmospheres is still being organized only slowly.

Departments of Gosplan USSR have developed proposals calling for accelerated construction of the plant for multilayer pipe and for more extensive incorporation of block units for pumping gas along the pipelines which make use of used aircraft turbines: this would make possible a significant acceleration of the construction of compressor stations and accordingly of mastery of the throughput capacity of main gas pipelines.

Steps to develop high-capacity, high-pressure (up to 100 atmospheres) gas pumping units in the next few years are called for. Implementation of this program will make it possible to raise gas transport to a higher technical level and to increase its efficiency considerably.

Besides the pumping of natural gas and oil from the eastern regions to the west through pipelines, the transportation of large quantities of coal to the Urals and the Volga regions, especially from the Kuzbass, is of pressing importance. This is because the Siberian railway trunks are already operating with above-normal loads on certain sections and in the future railway capacities in the eastern approaches to the Urals will decrease. Calculations indicate that the flow of freight in this direction will increase by a factor of 2-3 in the next 10 years, while coal haulage will increase by a factor of 2-2.5.

Studies conducted in this country and abroad confirm that pipeline transport of coal in the form of water-coal mixtures (pulps) has great promise. Coal pipelines have considerable throughput capacity while requiring a small number of personnel, may be fully automated, and can be built in shorter times than railroads. It is important to note that such pipelines have no harmful effect on the environment.

The essence of this method of coal transport is that at the place of extraction the coal is ground to a particle size of 2.5 mm or less, mixed in a 1:1 ratio with water and pumped through pipelines to power stations. In 1977 a group of specialists headed by Gosplan USSR Deputy Chairman A. M. Lalayants acquainted itself with the pilot construction and operation of the Black Mesa coal pipeline in the USA. This main coal pipeline, made of pipe 450 mm in diameter, is 4.7 km long and has been in operation since 1970, pumping 5 million tons of coal a year to a power station for which it is the only source of fuel. The

water which arrives with the coal is all used in the power station. The effective operating time of the hydrottransport system is 99.8 percent and the pipeline works stably at a pressure up to 100 atmospheres without interruption and with almost no wear to the pipe. This question of wear on the inner surfaces of the pipes is always raised at an early stage of discussions of the problem of hydrottransport of coal.

The construction of the coal pipeline in the USA cost only a third to a quarter what would have been required for the laying of a railroad line through the highly dissected terrain in which the pipeline was built. Only 30 persons are required for operation of all pipeline facilities.

Worldwide, not only coal but concentrates of iron and other ores are transported by pipeline. In particular, a pipeline system for transporting iron ore concentrate with a length of 70 km and a capacity of 1 million tons a year is in operation in Australia, while a similar system more than 60 km long with a capacity up to 12 million tons a year was put into operation in Brazil in 1977.

In the USSR there is experience with the operation of individual pipelines in the Kuzbass for delivery of lump coal with a piece size up to 90 mm to the Belovskaya GRES and the enrichment plant of the West Siberian Metallurgical Combine with a concentration of 10-15 percent of the mixture, as well as at the Noril'sk combine. Pipeline transport of different types of slags from mining enterprises to spoil heaps is being used on a large scale.

The All-Union Scientific Research Institute of Hydrottransport of Coal [VNI-gidrougol'], Ministry of the Coal Industry, the All-Union Scientific Research and Planning Institute of Progressive Transport [VNI-transport progress], Min-neftegazstroy, and the Teploelektroproyekt Institute [electrical equipment for heat engineering facilities] of the Ministry of Power and Electrification, have developed the technical and economic documentation for the construction of a pilot commercial pipeline for hydrottransport of coal from the Kuzbass to Novosibirsk (TETs-5) with a length of 250 km, a diameter of 427 mm and a working pressure of 100 atmospheres. Its throughput will be 2.3 million tons of coal a year. Pulp preparation plants are to be built in the vicinity of the mine.

This pilot commercial pipeline is necessary for development of the major process details and modes of operation and for testing the equipment. It will pass through regions which have climatic conditions similar to those in which the transmission of large quantities of coal to the Urals and the European part of the USSR by hydrottransport is planned for the future.

The technical and economic indices of the pilot commercial pipeline are as follows:

Throughput	2.3 million tons/year
Transport cost of 1 ton of coal	2.3 rubles
Capital investment	1.5 billion rubles
in industrial construction	500 million rubles

The technical and economic documentation gives a calculated economic effectiveness for the coal hydrotransport pipeline with a capacity of 25 million tons a year and a length of 1,800 km in comparison with railway transport; the results are as follows (in tons per ruble):

	Hydrotransport	Rail transport
Operating costs	3.1	6.1
Unit capital costs	34.3	71.5
Effective cost	7.2	16.9

The institutes of Gosplan USSR and Minneftegazstroy have made estimates for the transport of Kuznetsk coal equivalent to 25 million tons of standard fuel a year into the European part of the country by coal pipelines. The effective cost will be about two-thirds that for the construction of a railroad for transport of the same quantity of fuel.

A significant saving may also be realized by decreasing metal and labor consumption. The construction of a coal pipeline with pipe 1,420 mm in diameter, for example, will require 2.1 million tons of metal, while the laying of a new two-line railroad would require 4.3 million tons; only 2/11 as many workers would be required for construction, and 1/12 as many for operation, of the pipeline as for the railroad.

Hydrotransport has considerable promise. This is why it needs support from the ministries and departments, especially from the coal and chemical industries and ferrous and nonferrous metallurgy. According to a report to Gosplan USSR by the USSR Ministry of Ferrous Metallurgy, a relatively short (up to 15 km) hydrotransport system operating at a low pulp concentration is being used to transport overburden rock from opencuts, tailings from ore and coal enrichment, and iron-containing sludge from metallurgical units. This ministry has developed technical and economic documentation for the construction of a pulp pipeline for the transport under pressure of 36 million tons a year of enrichment tails over a distance of 20-25 km. In the next 2-3 years, a system for transporting concentrate from the Lebedin Ore Enrichment Combine to the pelletizing plant of the Oskol'skiy Electrometallurgical Combine, with a length of 26 km and a capacity of up to 7 million tons of concentrate a year, will be built. Using this new method of transport, ore may be sent from the mining enterprises of the Kuzbass to the metallurgical plants of the Dnepr region and Donetskaya Oblast and from the Pukhovsko-Sarbayevskiy Ore Enrichment Combine to the Magnitogorsk Metallurgical Combine. Hydrotransport is also suitable for the transport of ore and enrichment products in nonferrous metallurgy.

#### Pipeline Container Transport

Pipeline container transport, a new type of transport, has a number of significant advantages over other forms: increased speed of delivery, an uninterrupted transport process, the possibility of complete automation, elimination of transit losses, and a high throughput.

The development of this type of transport may play an important role in improving the structure of the country's fuel and power balance, development of mineral deposits located in difficultly-accessible regions, elimination of inefficient short railway hauls, and prevention of environmental pollution. In addition, a main aim of pipeline container systems will be replacement of large numbers of trucks and removal of part of the short-haul load on railways.

The idea of this new and progressive type of transport was conceived by Soviet scientists and specialists. Licenses have been bought by Japan and other countries; Japan has built two systems according to plans developed by the Transports [progressive transport] Special Design Bureau of Lavrent'evskiy RUSKH (Main Administration for the Transport and Supply of Petroleum and Petroleum Products).

The systems for industrial container transport by pneumatic pipeline are pipelines through which wheeled containers, either identical or of similar design, move at a speed of 50-60 km per hour in a current of air produced by blower stations.

The systems have loading and unloading stations, switches, truck units and automatic control equipment. The containers include pneumatic cars (pnevmovozy): unloaded containers equipped with sealing sleeves of special design which maintain a constant gap between them and the internal surface of the pipeline.

The first domestically-produced system, built in Georgia from a pipe 1,020 mm in diameter, hauls crushed stone a distance of 2.2 km; the rolling stock carries 10 tons and moves at a speed of 45 km/hr at an overpressure of only 0.07 atmospheres. The system is totally automated and is monitored by a single operator, which is one of its most important advantages. Many years' operation of the system in Shulaveri has confirmed the correctness of the design and the high reliability and cheapness of this new type of transport. The pipelines may be either underground (at various depths) or on the surface. When the systems are used for intra-plant transport, the pipelines may be laid along walls or under floors of production buildings, so that no special transport passages are needed.

The operation of pipeline container systems is independent of weather conditions, and accordingly it can assure uninterrupted movement of cargoes in any climatic zone. Since the pipelines may be laid in mountain areas, marshes and other difficultly-accessible terrain, the systems may be used where the employment of other types of transport would entail major technical difficulties and material costs.

There is also a rapidly-disassemblable variant of the pipeline container system which can be shifted from one place to another and is extremely convenient for the movement of various construction materials (sand, crushed stone, limestone, cement and other materials) in large construction projects, and for agricultural purposes (e.g. grain transport).

Because the wheels of the containers are covered with rubber or some similar material (e.g. polyurethane), they move silently and the pipeline transport system is very strong. These advantages make it possible to use the system extensively in urban conditions for the transport of various loads (raw materials, finished products, agricultural products, postal deliveries, domestic waste and so on). The systems consume less energy than other types of industrial transport (0.3-0.35 kWh/ton-km for the most economical version). Container systems



and also suitable for the hauling of large quantities of free-flowing loads (1-2 million tons a year) over distances of 10-15 km, since all loading, unloading and transport operations are completely automated. Container systems generally consist of two pipes: loaded containers or cars move through one and return through the other, either empty or with a different load.

In September 1975, the Collegium of Gosplan USSR discussed a proposal for more extensive incorporation into the national economy of pipeline container transport. Following a decision of the USSR Council of Ministers adopted in 1974, a certain amount of work was done: the Soyuztransprogress [progressive transport] all-union association and the VNIPltransprogress [progressive transport] scientific research institute were created within Minneftegazstroy, and the Transprogress Special Design Bureau of Glavneftesnab RSFSR was considerably expanded and given a large experimental base in Orekhovo-Zuyevo; test areas were built for all these organizations.

Minneftegazstroy has built a pilot commercial system using pipe 1,220 mm in diameter at the Sychevo Ore Enrichment Combine in Moscow Oblast. This transports runi-gravel from the openpit to the enrichment combine, replacing BelAZ-540 77-ton dump trucks. The cost of truck hauling there is 5-17 kopeks per ton-kilometer, while hauling in the container pipeline costs 2-6 kopeks per ton-kilometer. It is important to note in this context that the service life of the dump trucks is 4-5 years, while that of the pipeline system is at least 10 years. A pipeline container system has been built in Gor'kiy, and others are planned for Kazakhstan and Yakutia.

The large LIL0-2 system, more than 40 km long, with a pipeline diameter of 1,700 mm and a capacity of about 3 million tons of crushed stone a year, is being built in the Georgian SSR according to plans from the Transprogress Special Design Bureau. Its first stage will be put into operation in the near future and operation at full capacity will begin in 1980, when Tbilisi will be completely supplied with inert materials by pipeline.

In 1975 the construction of a container pipeline will be completed in Tul'skaya Oblast; the construction of a container pipeline transport system in Leningrad for removal of domestic waste, which will have major social significance, has already been begun; and systems are being planned for the coal industry and a number of construction ministries.

Nevertheless, we must state that the tasks assigned for the Tenth Five-Year Plan are not being fulfilled by certain ministries and departments, and the commercial production of the required equipment has not been organized. At the same time, these organizations are requesting capital investments for traditional types of transport and are not involving themselves in the introduction of new and progressive types.

The study stage has already been completed and systems for container transport by pneumatic pipeline have been prepared for extensive commercial introduction. Recently the State Experts Commission of Gosplan USSR made a detailed study of the state of development of the fundamentals of pipeline container systems and their technical and economic indices and recommended their extensive incorporation in view of the possibility of their having a considerable effect.

The Transprogress Special Design Bureau has developed and experimentally tested single-pipe systems for the hauling of up to 1 million tons a year of free-flowing loads over distances of 8 to 10 kilometers with mechanized loading and unloading. Technical and economic studies of such systems indicate that they can replace motor transport in construction industry operations, in mining sectors and in agriculture. The technical and economic indices of such systems, calculated for a system with a capacity of 500 tons a year, are as follows:

	Pipeline container system	Truck transport
Capital investment, thousand rubles	1,400	1,900
Transportation cost, kopeks/ton-km	5	15
Labor productivity, thousand ton-km/man	190	50
Number of operating personnel	20	70

The indices for two-pipe fully-automated systems with a capacity of 3 million tons a year have also been worked out. These systems have better characteristics: an operating cost of 2 kopeks/ton-km and a productivity 16-17 times that of motor transport. According to expert estimates, in the next 10 years the building of 900-1000 systems with capacities up to 1 million tons a year and 100-150 systems with capacities of 3 million tons a year may be expected; the overall technical and economic characteristics of these are likely to be as follows:

	Pipeline container systems	Truck transport
Capital investment, million rubles	1,800	2,500
Operating cost, kopeks/ton-km	2-5	5-15
Operating personnel per system	21-55	80-400
Number of operating personnel freed up	--	90,000
Number of trucks freed up (calculated as 12-ton trucks), thousands	--	44-45

The introduction into the national economy of this number of pipeline container systems will make possible the hauling of about 500 million tons of free-flowing loads a year and will free up motor transport with a capacity of 7-8 billion ton-kilometers a year. This will free up about 44,000 dump trucks a year, and allowing for a 40-year service life for pipeline systems the number of trucks freed up will be more than 750,000. The sharp increase in productivity will free up about 90,000 motor transport workers and save more than 1 million tons of gasoline.

In other words, the prospect is for large-scale measures with great economic effectiveness.

The Soyuztransprogress association and the VNIPtransprogress institute of Minneftegazstroy have developed proposals for the incorporation of pipeline container transport systems. Of considerable interest are industrial-process

long-distance pipelines of pneumatic and electromagnetic types which use linear drive systems. There are single-pipe shuttle lines or continuously-operating systems in which a certain number of containers or container cars, not mechanically connected to each other, will be in simultaneous operation on loaded and empty branches. These lines will be up to 50 km long with throughput capacities up to 50 million tons a year and pipeline diameters up to 1,400 mm. These systems will do up to 1.5 billion ton-kilometers per year of transport work, and the haulage costs will be in the range of 2-6 kopeks/ton-km.

This extremely promising type of transport has been tested in experimental facilities of the VNIITransprogress institute, and the first commercial systems are currently being planned. Their advantage is the possibility of achieving high throughput with relatively small pipeline diameters. Plans for main container pipeline systems of pneumatic, hydraulic or electromagnetic types with pneumatic, hydraulic or magnetostatic compensation of the weight of the rolling stock and with intermediate drive stations have also been developed. Such pipelines will be up to 1,000 km in length, will carry up to 100 million tons a year, will do up to 100 billion ton-kilometers of transport work a year, will have a unit energy consumption of up to 0.5 kWh per ton-kilometer, and will cost about 0.5-1.0 kopeks/ton-km to operate. Systems in this class may also be used for transporting viscous types of oil, ore and coal.

Recently a group of scientists and specialists of the VNIITransprogress institute developed a system of turbine-line transport which works like a turbine, being equipped with rotating vanes installed on the frames of the cars. The container train may be described as a stretched-out turbine impeller wheel. Studies and experimental work indicate that such systems have high throughput with relatively small dimensions. For a car capacity of 0.25 cubic meters, an operating time of 800 hours per year in a closed circular system and a speed of 36 km/hr, for example, 70 million cubic meters of freight can be carried per linear meter of rolling stock. Preliminary calculations indicate that the incorporation of 400-500 such systems for transportation of coal, ore and building materials will give the following economic effect (compared with motor transport):

Saving:

capital investment, billion rubles	1.4-1.5
metal, million tons	1.5-1.7
Decrease in operating personnel,	
thousands	400-500
Trucks freed up (as 12-ton trucks),	
thousands	200-250.

New transport systems are likely to be used in water engineering construction. The first such system is being planned for the construction of a reservoir in the Georgian SSR.

We should note one other important new direction: development of magnetic-suspension transport systems. The State Experts Commission of Gosplan USSR has discussed the technical and economic documentation for the incorporation of such a system in Alma-Ata in place of a subway. The technical and economic indices of such a system are given below in comparison with other types of transport:

	Magnetic suspension system	Subway	Fast trolley
Speed, km/hr	62	40	30-35
Passenger capacity, thousands	30	40	20-25
Construction cost of 1 km of two-way line, million rubles	2	8	4

Calculations indicate that the creation of such new systems in the cities, handling 20-30 thousand passengers an hour and moving at 60-100 km/hr, the creation of suburban lines connecting urban centers with airports and neighboring towns up to 200 km away, with speeds of 200-300 km/hr, and of main lines with speeds of 250-350 km/hr, will be highly effective. Currently an experimental section is being built in Ramenskoye. It will be used to test and perfect the main elements of the magnetic-suspension system.

It can be seen from the data presented that in addition to pipeline container systems, scientific research and experimental work have also produced other high-capacity forms of transport whose incorporation will fundamentally improve the transport of many kinds of freight.

In developing new deposits, it is generally necessary to deal with the problem of lack of roads and an undeveloped transport system. The construction of rail lines to haul the minerals is generally provided for, but this entails considerably greater expenditures than the construction of container pipelines.

We must also take into account the possibility of laying freight pipelines across the bottoms of large bodies of water. The construction of a pipeline along the bottom of the Sea of Azov from the Kerch' iron ore deposit to the metallurgical plant in Zhdanov may be considered suitable for incorporation into long-range plans. The construction of such a pipeline would decrease the hauling distance by more than 400 km.

The replacement of 280 million short hauls over distances less than 50 km on the nation's railways every year by pipeline transport in containers would make possible a saving of more than 500 million rubles a year on operating expenditures alone. The use of pipeline transport would make the operation of currently existing types of transport within certain distance and load limits easier. This applies to shipments such as cement, limestone, gypsum, grain and other materials, the hauling of which entails considerable expenditure and is attended by large losses.

Among free-flowing materials in construction industry shipments, cement and limestone account for the largest volume. The total expenditures on all transport operations in the shipment of cement to consumers amount to 6 rubles per ton of cement. Some 100,000 persons are involved in the loading and shipping of cement, while losses during loading, unloading and transport are considerable.

The problem of replacing truck hauling of grain and other agricultural products by pipeline shipment is an urgent one. Tens of thousands of trucks are occupied with grain hauling during the harvest. Grain losses during transport amount to 20 percent of the state purchase value, and energy expenditures on transport amount to 50 percent of that for the total complex of agricultural work.

Analysis of data on grain hauling indicates that if a network of container pipelines using asbestos cement, rubberized fabric or the new highly-filled polymer pipe developed by the Institute of Chemical Physics, USSR Academy of Sciences, were developed, the replacement of truck transport by pipelines would decrease operating costs to a quarter to a fifth of the present level, energy consumption would be cut by a factor of 16-18, and--most important--labor productivity would increase by a factor of 8-10.

Thus the examples presented indicate a high effectiveness for the development of pipeline container transport, which provides justification for the stepped-up construction of pipeline systems.

The Collegium of Gosplan USSR has adopted a resolution which calls for more active work on the part of departments and institutes of Gosplan USSR and the ministries and departments to organize the extensive incorporation of new types of transport in many sectors of the national economy, and especially in the mining, building materials and construction industries. It calls for careful discussion, in the State Experts Commission as well as the other organizations, of the program for building new-type transport systems over the long run and the organization of specialized production of the necessary industrial equipment, apparatus and instruments.

#### Current Work, Problems Detailed

Moscow PIANOVYE KHOZYAYSTVO in Russian No 5, May 79 p 127

[Communication by S. Kolpakov, Deputy Minister, USSR Ministry of Ferrous Metallurgy]

[Text] The USSR Ministry of Ferrous Metallurgy has discussed Yu. Bokserman's article "On New Progressive Types of Transport," published in PIANOVYE KHOZYAYSTVO No 11, 1978, and reports that it agrees with the main statements made by the author concerning the transport of large quantities of gas from Western Siberia into the European part of the country by pipeline under a pressure of 100-120 atmospheres and the incorporation of hydrotransport for the movement of coal and iron-containing materials.

In order to implement these measures, the USSR Ministry of Ferrous Metallurgy is building a plant for the production of multilayer pipes with diameters of 1,020 to 1,420 mm at the Vyksa Metallurgical Plant.

The opening of the first stage of the plant, with a capacity of 250,000 tons of pipe a year, is planned for 1981, and the commissioning of the entire plant, with a capacity of 1 million tons of pipe a year, for 1982.



Currently the buildings for the plant and the facilities for the priority complex are being built.

However, construction of the foundations for the main equipment is being delayed because the Elektrostal'iyazhmash production association of the Ministry of Heavy Machinery has still not issued the initial data for the development of plans; as a result the builders cannot obtain the required technical documentation.

In December 1978 the engineering specifications and manufacturing processes for the thick-walled single-layer pipe required for the installation of pipelines, as well as for their connection fittings, were approved. Currently the technical and economic documentation for the construction of plants to manufacture these items is being developed.

To speed up the incorporation of hydrotransport of iron-containing materials, the USSR Ministry of Ferrous Metallurgy has begun building a system for the transportation of iron concentrates in the form of a thickened pulp from the Lebedin Ore Enrichment Combine to the Dskal'skiy Electrometallurgical Combine, with a length of 26 km and a capacity of up to 7 million tons of concentrate a year. This system is being constructed using imported equipment.

The technical and economic documentation for construction of a pressurized pulp pipeline for transporting 36 million tons per year of enrichment tailings over a distance of 20-25 km is being developed. In 1979, with the participation of the VNIITransprogress institute of Minmetgazstroy, institutes of the USSR Ministry of Ferrous Metallurgy are developing the technical and economic documentation for construction of a system for hydrotransport of iron concentrates from the Krivoy Rog basin to the Yasinovataya Agglomeration Plant. A plan for expanding this work in the future, to include work on the transport of iron-containing sludge, has been drawn up.

But the incorporation of hydrotransport of iron-containing materials is being delayed by the lack of domestically-produced equipment (pumps, shutoff and control fixtures, automatic control equipment and the like).

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## TRANSPORTATION

### EXPLANATION OF UNDERFULFILLMENT OF CEMENT TRANSPORTATION PLAN

Moscow GUDOK in Russian 4 May 79 p 2

[Article detailing inquiry of "Gudok" correspondent, S. Kasatoy:  
"Cement. How To Compensate For Undershipping"7]

[Text] During the first quarter, almost 300,000 tons of cement called for by plan failed to be shipped on the Volga Line. What is the situation now? GUDOK correspondent S. Kasatoy received the following responses to his question.

Ye. Protasov, Station Chief, Volsk-united: Our station was indebted for approximately 4,000 cars of cement. The consignator was primarily culpable in this matter--the production association "Vol'sktsement". Not all the association enterprises utilize their rolling stock in an organized, systematic way. If at the "Krasnyy Oktyabr'" Plant idle time (demurrage) virtually coincided with the norm even during the coldest months, at the "Bol'shevik" Plant, idle time exceeded the norm by a factor of two. As a result, more than 450 car loadings were lost.

Furnaces and pulverizers frequently were down at the plants; electrical power was interrupted. Due to these factors, over a total period of thirty days, no cement was shipped at all. Our task now is to make up for the undershipment more quickly. In conjunction with our associates, we have outlined a series of measures. For example, the plants have begun to repair cars utilizing local resources, and have increased unit loadings by a half-ton. The Saratov Department is rendering considerable assistance to us; we are now receiving more valid information regarding cars which are being sent us, and we can prepare for their loss ahead of time. At present, 24-hour cement shipping requirements are being met.

V. Kupavskiy, Chief, Sales Department, Mikhaylovskiy Cement Plant: "We have many complaints against the railroad employees of the Sebryakovo station--they are supplying us very poorly with rolling

stock. In addition, numerous cars arrive in a state of disrepair. We can ship up to 70 percent of the cement in through trains, but the level of block traffic routing is 10 percent lower.

Approximately 70,000 tons of ready materials have accumulated in our warehouses at the present time."

A. Turbin, Chief, Sebyakov Station:

"Yes, the cement workers' complaints against us are justified. But are we the total problem? Afterall, speaking candidly, the Volgograd Department shorts us in rail cars: they provide us too few and those are of poor quality. In order to extract ourselves from this situation, we have, in conjunction with our associates, adopted extraordinary measures. The cement workers have provided us a bulldozer, dump-truck, compressor, welding equipment, and a railcar for quarters. We installed telephone communications, laid a rail line, and through the resources of the Filonovskiy Car Depot set up repair operations for covered and cement cars. Now all cars leave the station in good condition."

N. Morozov, Department Chief, Volga Traffic Department Bulk Loading Service:

"We are now implementing widely the know-how of the Chelyabinsk workers. They decided to renovate cars using organic resources at many industrial enterprises. This facilitates to a great extent an improved car readiness and rolling stock preparation for cement carrying operations. Additionally, all covered cars loaded in Vol'sk and Sebyakovo destined for construction sites located in our road zone, are after unloading, again dispatched for cement.

Unfortunately, we are not successful in utilizing the cement carriers with full efficiency due to their unsatisfactory commercial and technical maintenance. They arrive from the consignees with remnants of unloaded cement, with open hatches, etc.

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## WINTER NAVIGATION TESTS ON CASPIAN SEA AND LOWER VOLGA

### Preliminary Experimental Results

Moscow VODNYI TRANSPORT in Russian 24 May 79 p 2

[Text] Caspian Sea and Volga River workers have carried out a combined experiment in the provision of winter water transport between points on the Caspian Sea and the Lower Volga ports of Astrakhan' and Volgograd for the first time in the practice of navigation.

Our newspaper has already reported in depth on the details of the operational part of this important experiment. Today we will review the preliminary results.

The winter ice operations were supervised by an interdepartmental staff of sea and river workers in Astrakhan'. The staff has commented that although the experiment was nominally successful, many questions were left unanswered.

A primary problem that has yet to be solved is that of maintaining normal operations during the winter at the many river crossings within the boundaries of Astrakhanskaya Oblast'.

The Astrakhanskaya Oblast' Road Administration is responsible for maintaining the local crossings. The administration is still unprepared for work under conditions of the winter breakup of the ice, and we might add, will not be prepared until the sea and river workers become more involved.

In fact, an auxiliary ice vessel is needed to maintain the crossings. However, this problem was not taken into consideration, which caused a more than one month delay of the navigation test. A lack of agreement also was evident in the rerouting of the cargo; which although it was transferred in the port of Astrakhan' from a sea-going dry cargo vessel into the hold of the Volga Steamship Line vessel "50 Let SSSR", it was not forwarded promptly to Volgograd. This fact complicated the ice passage along the route that had been carved out earlier by the ice breaker "Kapitan Krutov".

The trip of the dry cargo vessel "50 Let SSSR", under tow in the wake of the ice breaker "Kapitan Bukayev" through enormous ice jams, could be classified as being unparalleled in the history of navigation on the Volga. It makes the unsuccessful processing of the vessel in the port at Volgograd appear even more disappointing. The vessel approached the piers at 2300 on 1 March; but the emptying of the contents of the hold didn't begin until three hours later, and even then only one crane was used. Despite the fact that a second crane was added in the morning, the delay was extremely costly. Cargo handling operations were interrupted at noon because of extensive ice movement, with 500 tons of rubble remaining to be unloaded. In all, the navigation vessel stood in port in Volgograd until 21 March.

The ice test serves as a reminder of the need for a higher degree of operational cooperation between the sea and river workers. Additionally, there was a lack of interest on both sides; departmental barriers also sprang up. The natural demarcation of the zones of winter navigation was one barrier; and, sadly enough, could continue to be so. For the sea workers, the zone ends at Astrakhan'; but for the river workers it extends to Volgograd. Assisted by the ice breaker "Kapitan Izmaylov", which was fitted with the ILP-18 attachment, the sea workers acquitted themselves exceptionally well. By as early as the beginning of February they had constructed a path in the ice between Astrakhan' and the sea end of the Volga-Caspian canal. However, the river workers independently broke up the ice as far in as the shoreline, which severely hampered the pilotage of vessels in the Bakhtemirskiy Branch. The sequence of discharging the ice into the sea also was interrupted. Artificial ice jams were formed at crossings, which had to be shut down. These conclusions were made by P. Miroshnichenko, a chief state inspector from the Administration of the Northern Sea Route. Unfortunately this authoritative expert was not included on the ice operations staff. By the way, waterways engineers, representatives from the register and the river navigation inspectorate, as well as those from the oblast department of roads, which maintains the crossings, for some reason or other, also were not included on the staff. Therefore, P. Miroshnichenko in his technical report arrived at the categorical conclusion that the organization of the interdepartmental management of ice breaker organizations had failed to prove itself in practice. Consequently, he recommended the creation of a "purely departmental staff for ice piloting, without the participation of the Ministry of the "River Fleet." I feel that such departmental limitation of the staff would be harmful to operations. Additionally, it reflects an attitude of seeking isolation from the river workers, so that the Caspian Sea Steamship Line will be predominant.

The preference for separate, so-called coordinated operations over interdepartmental management is spawning new misunderstandings. The need for an interdepartmental type of management of operations is dictated by the very technology of ice breaker operations, which cannot get underway until the canal is broken up and can then only continue on the river reaches through to Volgograd. What else can be said. The sea workers have accumulated



vast experience in conducting ice breaking operations. The river workers are still novices on the ice routes. This is why the only path to success would be through the strict observance of the principal of interdepartmental supervision of operations and this conferring of broader authoritative powers to the combined staff for ice operations.

More than 50,000 tons of national economic cargo were moved from the Caspian Sea to ports on the Lower Volga during the winter experiment. But this is not the only measure of the importance of the experiment. The potential of the ice-breaker and cargo ships were tested. Nozzles were found to be especially vulnerable parts of the vessel "Sormovskiy", because they were blocked up constantly with ice. Sludge ice covered the inlets to the engine cooling systems, which caused overheating. When the ballast tanks were being filled, condensation gages froze in the pipes and ice outgrowths were formed in the tanks. The staff accordingly recommended that a special river transport fleet be built for around-the-clock operations. Since this would be a long-term project, the immediate solution is felt to be in the modernization of other river vessels. But specific proposals for modernization projects, in fact, have not been drafted as yet. Only the Sormovskiy-class dry cargo vessels have been tested. Unfortunately there have been no opportunities following the ice operations to examine carefully the hull and steering systems of these vessels using ship hoisting facilities.

Shortcomings in port services to the fleet have been identified. One right bank transshipment zone in the port of Astrakhan' clearly is performing below standards by having only one working crane. Two other cranes that were installed here are inoperable, owing to a weak power system that is only supplied by a make-shift electric circuit.

The central cargo zone in the port is literally choked during the winter with passenger vessels from the Uritskiy yard. Only when vessels are moved to Pier 17 is access made available to the central zone. Until then the Astrakhan' will be unable to use fully the floating transshipment equipment. The effects of the lack of at least one small harbor-type ice breaker also are being felt. Such an ice breaker also will be needed in the port of Volgograd.

Right now is the time for the sea workers to take action on the advice of the river workers to stockpile cargo for the winter navigation season early. This will make it possible to load the vessels on both ends of the line.

The results of the experiments revealed that the waterways engineers evidently were not prepared for winter operations. Maintenance of the navigation markers left much to be desired both in the channel and at sea. The sea-going vessels also were forced to operate with extremely light loads because of the shallow depths in the channel.

In a word, the experiment on the Lower Volga and the Caspian Sea brought many problems to the attention of the specialists. Nevertheless, the primary results of the experiment testify to the feasibility of winter navigation operations in this area.

#### Deputy Minister Responds

Moscow VODNIY TRANSPORT in Russian 19 Jun 79 p 2

[Text] The article "Caspian to the Lower Volga: Winter Navigation Zone," published in the 24 May edition of this newspaper, contained a discussion of the results of experimental shipments under winter conditions in a section of the Volga River from Volgograd to Astrakhan'. L. N. Ryamzin, deputy minister of the RSFSR River Fleet has responded to this article.

The deputy minister notes in his response that winter cargo runs were a unique test of the capacities of the ice-breaker facilities and cargo vessels. The operations were extensively hindered by ice jams. USSR Register ice class cargo vessels of the Sormovskiy type were unable to move independently along the ice paths. Movement of the vessels was only possible under a tow by small tugs in the wake of the ice breakers. Fleet winter operations consequently require the construction of special attachments to these vessels.

Specific difficulties in conducting the experimental shipments resulted from a shortage of ice breakers in the ports, a lack of coordination when shipments are rerouted, and the need for managing the winter crossings over the Volga.

The newspaper correctly observed that unified, interdepartmental leadership should be provided during the carrying out of ice operations on the Volga and Caspian channel and in the Volgograd and Astrakhan' sector.

After examining the results for winter navigation over the 1978 to 1979 period, the collegium of the Ministry of the River Fleet identified the main patterns for organizing shipments during the extended period of navigation while ensuring guaranteed operating schedules for vessels: from December until the onset of continuous freezing-up and during the first week of March, using forced ice drifting.

The ministry is now drafting a program for handling shipments in late autumn of this year.

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## TRANSPORTATION

### IL'ICHEVSK-VARNA FERRY CROSSING

Moscow VODNYY TRANSPORT in Russian 28 Jun 79 p 1

[Article by V. Federov: "Il'ichevsk-Varna -- Clearly, Efficiently and With High Quality"]

[Text] Six months have passed since the solemn day when the first unit of the unique Il'ichevsk-Varna ferry crossing became operational and thus designated a new step in the path of universal cooperation and deepening of socialist economic integration. The effect of this transport mainline is based on the principle of complete equality of rights and respect for the national interests of two fraternal countries.

The enormous potential capabilities established in the crossing require purposeful and persistent efforts and measures from both parties, directed toward providing high operating efficiency. And much has already been done in this direction during the past 6 months.

One of the most important factors for increasing the efficiency and operating quality of ships and shore complexes of the crossing is universal development of the socialist competition of Soviet and Bulgarian workers and specialists, seamen and port workers. Understanding this well, the collectives of the Black Sea Shipping Company and of the ferry complex at Il'ichevsk, the Odessa-Kishinev Railroad and the Bulgarian Maritime Fleet Shipping Company, the Bulgarian Railroad Association and the ferry complex at Varna concluded an agreement in March of this year for a complex international socialist competition directed toward the most rapid assimilation of the production capacities of the international Il'ichevsk-Varna ferry crossing and efficient use of it. Much has been done during the past few months according to the agreement and although the results, as provided by the conditions, will be summarized for the 6 months at the routine meeting of the council of directors, one can already state confidently that the complex competition of the transport

workers of both countries on the crossing is yielding discernible results.

According to the pledges, ferry traffic is provided strictly according to schedule within normal deadlines. The transport conveyor on the crossing began to operate even more clearly and smoothly with introduction of the second Soviet ferry "Geroi Plevny" into operation and with elimination of some organizational and technical deficiencies on loading and unloading rail cars.

The work of the ferry complexes at both Varna and Il'ichevsk is being improved on the basis of a unified production process. According to the agreement, unified dispatcher shifts of port and railroad workers have been created at both ferry complexes and a socialist competition has been organized between them. The shifts of the Il'ichevsk shore complex have already been determined the leaders in the competition. These are the unified dispatcher shifts of V. Balakin-M. Vitruk and M. Shcherbakov-S. Matskevich. The deputy chief of the warehouse facility A. Zhilinskaya, tackle operators G. Zinov'yeva and O. Kushnir, operator Ye. Kolesnikova, railroad station duty officer L. Chernysh, diesel locomotive engineer V. Rymar' and many others are coping well with their own duties.

The railroad workers of the Zastava-1 rail car depot and the Odessa-Marshalling Yard locomotive depot, on whom clearness and operativeness in rail car delivery to the crossing and consequently the time of handling the ferries largely depend, were included in the competition of the shore complex workers. The results of the labor competition are summarized monthly and both moral and material methods of stimulating the best collectives and producers are utilized extensively.

The workers of the shore ferry complexes are faced with even more complex, responsible tasks, solution of which is provided in the agreement for the competition. They pledged to assimilate the design capacity of the first unit of the ferry complex this year and to direct their efforts toward complete loading of ferry vessels in both directions and toward improving the control of production processes. They also pledged to guarantee the operation of vessels on schedule by reducing the running time for a round trip to 35 hours, to achieve a fuel saving by 2.5 percent and an oil saving by 2 percent, to carry out repair operations by the efforts of each crew worth 12,000 rubles and to develop and introduce no less than 6 efficiency proposals.

"Enriching each other with experience and assisting each other to overcome difficulties, we will see that the international ferry crossing will become a model and standard of operation for any transport terminal," says the captain of the ferry "Geroi Shipki" A. Yakutin.

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